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2019-11-21

Nemcok , M 2019 , ' Active and passive : Two ways party systems influence electoral outcomes ' , European Political Science Review , vol. 11 , no. 4 , pp. 451-467 . https://doi.org/10.1017/S1755773919

http://hdl.handle.net/10138/310197
https://doi.org/10.1017/S1755773919000250

acceptedVersion

Active and Passive: Two Ways Party Systems Influence Electoral Outcomes

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Abstract: Parties can not only *actively* adjust the electoral rules to reach more favourable outcomes, as is most often recognized in political science, but they also *passively* create an environment that systematically influences electoral competition. This link is theorized and included in the wider framework capturing the mutual dependence between electoral systems and party systems. The impact of passive influence is successfully tested on one out of two factors closely related to party systems: choice set size (i.e. number of options provided to voters) and degree of ideological polarization. The research utilizes established datasets (i.e. Constituency-Level Elections Archive, Party System Polarization Index, Chapel Hill Expert Survey, and Manifesto Project Database) and via regression analysis with clustered robust standard errors concludes that the choice set size constitutes an attribute with passive influence over electoral systems. Thus, it must be reflected when outcomes of electoral systems are estimated or compared across various contexts.

Keywords: party systems; electoral systems; choice set size; polarization; theoretical framework

This article will be published in *European Political Science Review* (currently available as First View)

Introduction

The relationship between parties (grouped into party systems) and electoral systems is often perceived as a cyclical connection. In one direction, electoral systems transform votes into seats and determine representation of parties in an assembly (Duverger, 1954; Shugart, 2005). In the other direction, parties may exercise their power over electoral legislation and transform electoral rules with the intention to reach more favourable outcomes (Taagepera, 2003; Colomer, 2005, 2018).

However, the latter connection describing the influence of parties over electoral systems is only part of the story. Parties can not only *actively* adjust the electoral rules to nudge voters into choices that can increase their electoral shares; but they also *passively*, with no intention, create an environment that has a systematic impact on voters' behaviour and subsequently influence electoral outcomes (see figure 1). For example, overcrowded party systems can become a cognitively overwhelming factor which may cause voters to fail to respond to strategic incentives in the way intended by the designers of the electoral rules.

This research aims to bring this conceptual addition to the relationship between parties and electoral systems and empirically confirm its influence. The paper examines two integral attributes of party systems – choice set size and degree of ideological polarization – which represent two substantively different approaches describing party systems. While choice set size focuses on an aggregated quantitative description of a party system, ideological polarization aims to do the same, however from the qualitative perspective.

On the side of electoral systems, the research employs the predictive logical models developed by Taagepera (2007). His predictive models use only two institutional variables – country's average district magnitude (M) and its assembly size (S) – to predict the largest party

seat share and effective number of legislative parties. These predictions are used as a benchmark for given institutional settings and the research examines whether the selected attributes of party systems are associated with increasing differences between the real electoral outcomes and their predicted values based on Taagepera's models.

The passive influence of party systems is tested on data included in several acknowledged datasets: Constituency-Level Elections Archive (CLEA) (Kollman *et al.*, 2014), the Manifestos Project Database (Lehmann *et al.*, 2017), Chapel Hill Expert Survey (Bakker *et al.*, 2012), and Party System Polarization Index (Dalton, 2008, 2017). Based on the results, this research concludes that the choice set size constitutes a relevant attribute of party systems that is passively influencing the outcomes of electoral systems. The second attribute, degree of ideological polarization, was not confirmed as influential. Nevertheless, the former factor must be taken into account when estimating the outcomes of electoral systems, predicting the impact of electoral reforms, or comparing them across various contexts.

This paper has the following structure: it first reviews the literature related to the two selected attributes of party systems and formulates the expectations about their passive influence on electoral outcomes. The subsequent part presents the data sources and measures used in the research. Lastly, the analytical part presents the results, which are followed by the discussion and conclusions.

Interactions between party systems and electoral systems

The links between party systems and electoral systems have previously been studied from both sides, and parties as well as electoral rules have been perceived as a cause and as a consequence of each other. In one direction, the institutional setup of an electoral system is expected to have

mechanical and psychological effects on voters' behaviour which in turn influences the shape of the party system (Duverger, 1954). This rather institutionalist approach grew into the "Duvergerian agenda" (Shugart, 2005) and remains very influential in political science today.

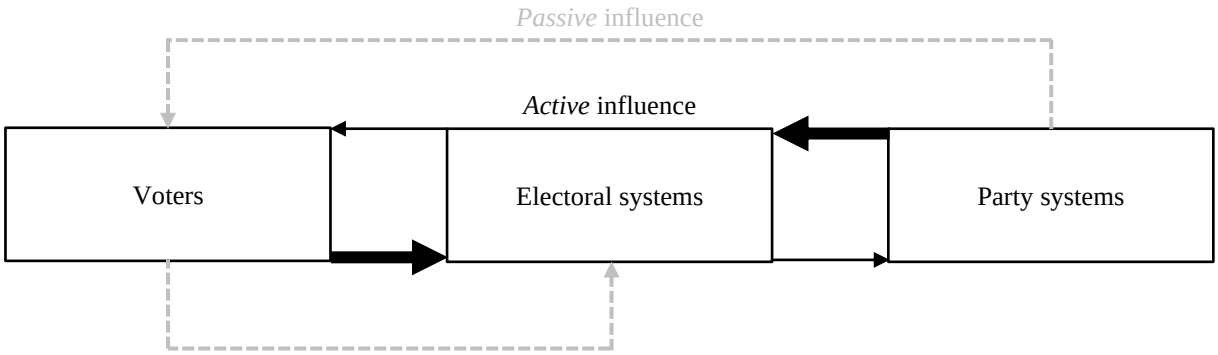
However, several authors turned the dependence of party systems on electoral systems upside down. Rokkan (1968) argued that this casual sequence, which treats electoral systems as cause and party systems as consequence, makes little sense in many cases when party strategists intentionally adjust the electoral legislation when aiming to consolidate the power of their own party. This claim was empirically supported by e.g., Lijphart and Grofman (1984) and Colomer (2005), with the latter study concluding that "it is the number of parties that can explain the choice of electoral systems, rather than the other way around" (Colomer, 2005, p. 1). Taagepera (2003, p. 5) also spotted a "causality following […] from the number of parties towards electoral rules" and therefore proposed a cyclical scheme that incorporates the impact of electoral systems and party systems in both directions (Taagepera, 2007, pp. 3–4).

The black part in figure 1 represents the mutual dependence of party systems and electoral systems as it is often described in the literature (for review, see Colomer, 2018), however the grey dashed arrow has not been included in this theoretical framework so far. The lower part captures approach based on Duverger's work, which focuses on voters casting ballots to electoral systems that subsequently influences the shape of the party system.[1] The upper black part captures the *active influence* of parties on electoral systems, which is based on the authors who turned

[1] It should be added that the literature includes also predominantly institutionalist works focused directly on institutional setups of electoral systems and their impact on party systems while paying negligible attention to voters' behaviour and decision-making.

Duverger's law upside down and documented that parties also actively modify electoral law with an intention to influence voters' behaviour and increase their electoral gains.

Figure 1. Conceptual distinction between active and passive influence of party systems on electoral outcomes



This paper claims that the black part of the scheme is not a sufficient description of the relationship between electoral systems and political parties. The reason is that it omits the *passive influence* included in figure 1 as a grey dashed line. *Passive influence* is a tendency of party systems to unintentionally, but systematically, influence voters' behaviour through some of their characteristics (such as size or ideological polarization). For example, too many options provided to voters can become overwhelming and result in an increasing abstention (e.g., Taagepera, Selb and Grofman, 2014) or decrease of correct voting (Cunow, 2014; Muraoka and Barceló, 2017). The fact is that some findings included in comparative studies of electoral systems indicate that party systems have this kind of passive influence on voters behaviour (Dalton, 2008; Karp and Banducci, 2008), however, they have not been incorporated into a coherent theoretical framework. That is done by this study. The proposed conceptual framework allows to systematically acknowledge the passive effects that may increase the ability of political science to accurately

predict consequences of electoral reforms, which has been so far rather low (Farrell, 2010; Bowler and Donovan, 2013).

The concept of passive influence of party systems, as described here, may resemble the indirect effects of electoral systems from the political science literature. However, they both have different theoretical underpinnings. When literature speaks about the *indirect effects* of electoral systems, it usually sees a linear sequence starting at voters casting a ballot via electoral system which *directly* determines sizes of parties and *indirectly* influence other aspects related to performance of political systems (Norris, 2004; Lijphart, 2012). Alternatively, the studies focus primarily on electoral systems, irrespective of how voters cast their votes, and examine how their institutional setup influence number and ideological dispersion of parties (Cox, 1997; Taagepera, 2007). If we stay on the grounds of party systems, the two major topics in both of these streams in the literature are impact on ideological positions of parties (e.g., Cox, 1990; Dow, 2011; Adams, 2012; Curini and Hino, 2012), and quality of representation (e.g., Cox, 1997, pp. 225–237; Powell and Vanberg, 2000; Ezrow, 2010; Kim, Powell, Jr. and Fording, 2010). However, the list goes on and disperses into numerous other areas of political science. In contrast to that, *passive influence* firstly recognizes that party systems may acquire a specific set of attributes. These conjointly create a context in which voters' decision-making takes place. That brings party systems back to voters (see figure 1). As a result of the passive influence, an identical voter may behave differently in two different contexts imposed by party systems with two different sets of attributes.

The paper examines the passive influence of two substantively different attributes of party systems – their size and ideological range – which are briefly introduced here and further discussed below. This selection includes an aggregated quantitative, and an aggregated qualitative descriptive attribute of party systems which are frequently used in the political science literature.

Therefore, this study tackles the broad agenda of studying interactions between parties and electoral systems and suggests the direction for future steps.

The first selected attribute is a quantitative one and it measures the number of options provided to voters on the ballot, also known as a "choice set size" (Cunow, 2014). It builds on classical works by Blondel (1968, 1990) and Sartori (1997), who noticed that party systems consisting of a comparable number of parties also reveal comparable features and could be categorized together. However, when political scientists count parties, they often use the effective number of parties as proposed by Laakso and Taagepera (1979). Unfortunately, this quantity is non-intuitive and quite distant from a regular voter. Therefore, this study focuses on the number of options directly included on the ballot, which is a quantity directly interacting with voters during an electoral act.

The second attribute is a more qualitative characteristic of party systems and measures their degree of ideological polarization. It is included because a solely quantitative measure does not sufficiently capture the dilemmas faced by voters when making an electoral choice. An increasing number of parties can, but does not have to, increase the ideological polarization of a party system (Cox, 1997; Dalton, 2008), which would determine how cognitively difficult it is for voters to distinguish between electoral alternatives (Cunow, 2014, p. 10). Thus, the degree of polarization may influence voters' decision-making processes and subsequently their electoral behaviour.

Choice set size: Number of options provided to voters

When turnout is discussed, the options provided to voters are perceived as an important determinant of voter participation (Franklin, 2004; Blais, 2006; Blais and Aarts, 2006; Geys, 2006). In general, a wide range of options and fewer wasted votes are considered to be the main

reasons why elections under proportional representation (PR) electoral systems stimulate voters to higher participation rates (Lijphart, 1999; Karp, 2012). However, this effect works only to a certain degree. When voters are provided with too many options, the need to follow the electoral competition becomes overwhelming and voters' high level of confusion results in their abstention from voting (Grofman and Selb, 2011; Taagepera, Selb and Grofman, 2014; Muraoka and Barceló, 2017).

An analogous situation applies to voting itself. On one hand, PR systems are perceived as the more permissive ones because they allow more parties to enter a system. Increasing number of parties is expected to allow representation of a wider array of societal groups and their demands what simultaneously increases representativity of the elected assemblies as well as governments and implemented policies (Powell, 2000; Persson and Tabellini, 2005; Carey and Hix, 2011). On the other hand, every electoral system expects a certain degree of strategic coordination among voters in response to institutional constrains (Taagepera and Shugart, 1989; Cox, 1997). The coordination ensures that voters can effectively utilize their participation in the elections and communicate their preferences to the political system (Bawn, 1999; Cox and Schoppa, 2002). However, with too many options available, the electoral environment becomes too complex and cognitively too demanding for an efficient strategic coordination among voters (Cunow, 2014; O'Brien, 2017). At the end of the day, participating voters may cast their ballots inconsistently with the behaviour expected by the designers of the electoral system and the system may thus fail to deliver expected outcomes.

Research in psychology and in consumer choice suggests that an abundance of options can lead people to select simpler options which are in fact suboptimal choices (Iyengar and Kamenica, 2010; O'Brien, 2017). Moreover, large choice sets can result in complete avoidance of the

decision-making process, because people aim to avoid possible regret which could result from a suboptimal selection (Iyengar and Lepper, 2000; Schwartz *et al.*, 2002). In line with this logic, elections with too many options "may thus lead many voters to avoid participating entirely and may lead others to make voting errors" (Cunow, 2014, p. 3).

Given the direct connection between cognitive capacity, electoral systems, and voters' behaviour, it is surprising that the issue of designing electoral systems with respect to cognitive demands has received only limited attention in political science (Carey and Hix, 2011, p. 6). A few studies on this topic have discovered that the presence of a third candidate in the American presidential elections increases shares of incorrect voting (Lau and Redlawsk, 1997; Lau, Andersen and Redlawsk, 2008) and a different number of candidates may change heuristics that people rely on while making their electoral decisions (Lau and Redlawsk, 2001; O'Brien, 2017).

In addition, several electoral studies have examined the capability of voters to comprehend the more complex electoral mechanisms (i.e., mixed electoral systems) emerging during the 1990s (see e.g., Banducci, Karp and Vowles, 1998; Bawn, 1999; Gschwend, Johnston and Pattie, 2003; Karp, 2006). Their conclusions are mostly in line with Shugart and Wattenberg (2003, p. 592), who claim that "mixed-member systems […] are not necessarily more complex than many other frequently employed systems," however, these studies examined voters' ability to understand complicated institutional setup, not voters' decision-making embedded in a complex electoral environment.

Thus, it remains a question whether increasing choice set size (as a reflection of increasing party system size) operates only on the individual level or whether it may become a force strong enough to systematically alter the outcomes of an electoral system. Therefore, based on the literature discussed, the following expectation is proposed:

Choice set size hypothesis: *For a given set of electoral rules, increasing the choice set size (i.e., the number of options provided to voters on the ballot) increases the difference between real party system fragmentation and its expected value.*

Polarization of a party system

Choice set size is a good quantitative indicator that captures how many options a voter has to consider before making an electoral decision. However, it does not reveal reliable qualitative information about the demands for arriving at the decision. Therefore, in addition to the number of options, one has to consider the density and range of ideological space occupied by parties (Sartori, 1976; Dalton, 2008). A decreasing number of parties in the same ideological space increases the ideological differences between the parties (Cox, 1997; Persson and Tabellini, 2005) and makes it easier for a voter to distinguish between alternatives (Cunow, 2014; O'Brien, 2017). Lau et al. (2014, p. 257) examined the levels of correct voting across various contexts and concluded that the "greater ideological distinctiveness among the competing parties or candidates [is] associated with higher levels of correct voting."

Therefore, too many ideologically overlapping parties packed within a narrow ideological space makes it more demanding for a voter to distinguish among candidates included in the choice set and select the closest alternative. This significantly increases the demands for efficient strategic coordination among voters and allows the electoral system to result in fragmentation that deviates from expectations for the given set of electoral rules. The votes could end up being split among ideologically overlapping candidates, which obviously increases the fragmentation of electoral results, even when it is expected that electoral rules keep the fragmentation low.

I follow the findings by Cox (1997) and Persson and Tabellinni (2005), who concluded that the overall degree of polarization already influences the ideological distance between subjects present in a system. Based on this assumption and the literature discussed, the research assumes following:

> Polarization hypothesis: *For a given set of electoral rules, increasing ideological polarization of a party system, while keeping the choice set size constant, increases the difference between real party system fragmentation and its expected value.*

If at least one of the hypotheses is confirmed, the research may conclude that the passive influence of party systems plays a role in shaping the electoral outcomes. Therefore, the passive influence should be considered when electoral outcomes or consequences of electoral reforms are estimated or compared across various contexts.

Data and methods

The biggest challenge for the methodology of this research is the construction of the dependent variable. Since this paper examines the effects of the two above-mentioned factors on the resulting fragmentation of electoral outcomes, this research needs to compare the actual fragmentation of these outcomes to their expected value. This is accomplished in two steps: First, a suitable conceptual framework needs to be found which can provide a benchmark, i.e., an expected value of fragmentation of electoral outcomes for a given set of electoral rules. Second, the research needs to develop an appropriate way to compare this quantitative prediction to the actual electoral (i.e., empirical) outcomes.

Taagepera (2007) carried out relevant work in quantifying the expectations we have of electoral systems. His core contribution to electoral studies is the Seat Product. This consists of two main variables – a country's average district magnitude (M) and its assembly size (S). Based on these two variables, Taagepera (2007, 2018) develops a series of "quantitatively predictive logical models" which estimate the effects of electoral systems to a surprisingly accurate degree. The ability of these models to predict empirical outcomes was successfully documented by Taagepera (2007), Li and Shugart (2016), and Shugart and Taagepera (2017).

This research uses two models that are directly connected to the party systems – one predicting the largest party seat share, and the second predicting the effective number of legislative parties. The first model predicts the seat share of the largest party elected to the assembly ($\widehat{s_1}$).[2] Taagepera (2007, pp. 122, 138–139) argues and empirically proves that the best estimation of the largest party seat share is equal to the inverse 8th root of the product of M and S (i.e., Seat Product)[3]:

$$\widehat{s_1} = \frac{1}{(MS)^{1/8}} = (MS)^{-1/8}$$

[2] Largest party seat share is a useful quantity that can indicate relevant information about the stability of a system. If the largest party is expected to gain more than 50% of the seats, the system should be stable, because the largest party has enough seats to sufficiently support its single-party cabinet. Even if the expected largest party seat share is below 50%, the value gives a helpful hint about the largest party's weight in the coalition or its blocking ability in the opposition.

[3] Both of Taagepera's models are properly defended on logical grounds and presented in Taagepera (2007, pp. 115–164). Unfortunately, the space constraints do not allow to present the logic here. However, Taagepera's logic is also effectively summarized by Li and Shugart (2016, pp. 26–27) or Shugart and Taagepera (2018).

The second model predicts the effective number of parties with legislative representation ($\widehat{N_s}$).[4] Taagepera (2007, p. 152) successfully empirically tests the model which states that the best estimation of $\widehat{N_s}$ is equal to the sixth root of Seat Product:

$$\widehat{N_s} = (MS)^{1/6}$$

Even though Taagepera (2007, pp. 23–46) originally advised that the logical models work only for simple electoral systems, the later work by Shugart and Taagepera (2017, pp. 285–307) observed that they also work satisfactorily for complex systems, just with larger random scatter. Therefore, this research is based on all cases included in the below-specified datasets and treats them as if they were simple systems.[5] Excluded are only elections in countries with electoral systems for which the average district magnitude M cannot be computed unambiguously. This is mostly the case of mixed electoral systems with two overlapping tiers (see Shugart and Wattenberg, 2003). Depending on the data availability of electoral results and different polarization statistics, individual parts of the analysis examine between 52 elections (available in

[4] $\widehat{N_s}$ refers to the effective number of parliamentary/seat-winning parties. For the formula see Laakso and Taagepera (1979).

[5] It has to be mentioned that Li and Shugart (2016) and Shugart and Taagepera (2017, pp. 285–307) develop an extension of Seat Product for complex electoral systems. However, its additional parameter requires to input upper-tier seat share (i.e., seats allocated regionally or nationwide rather than in local districts). This information is hardly available for significant portion of systems included in the datasets utilized in this study. Therefore, implementation of the extension would result in extensive exclusion of cases, while benefits of such action would nevertheless remain uncertain. The reason is that the Seat Product Models work fine for *some* complex systems. For the rest, they still provide reasonable predictions (Shugart and Taagepera, 2017, p. 306).

the *Chapel Hill Expert Survey* database) and 221 elections (available in the *Constituency-Level Elections Archive*). The elections were conducted between 1945 and 2016 around the globe (see Online appendix A for the list of included elections).

It must be noted that Taagepera's quantitatively predictive logical models serve first and foremost as a benchmark estimating the largest party seat share and the effective number of legislative parties for given institutional setup of an electoral system without considering any other forces that could potentially influence electoral outcomes (Shugart and Taagepera, 2017, pp. 113–114; Taagepera, 2018, p. 5). That being said, they are not supposed to be perfectly accurate predictions about party system fragmentation, "but all others are worse" (Taagepera, 2007, p. 47). Nevertheless, they are sufficiently precise estimations about the expected value of the effective number of parties or the largest party seat share, when very little information about the electoral system is available.

Now, when the benchmark is set, it is time to approach the second step in the development of dependent variable and find a suitable way to compare real and expected party system fragmentation. This measure would allow to examine whether two selected characteristics of party systems are associated with cases when fragmentation in electoral results is substantively different from the expected value.

I follow the approach presented and successfully empirically tested by Nemčok and Šedo (2018), who divide real electoral outcome (i.e., largest party seat share or effective number of seat-winning parties) by the theoretical prediction based on one of the logical models (i.e., $(MS)^{-1/8}$ or $(MS)^{1/6}$, respectively). The reason for using division instead of subtraction is that the largest party seat shares as well as effective number of parties can vary greatly across various systems. If a prediction is off by one party in a five-party system, it is still a decent estimation because it

nonetheless deals with a category of multiparty systems. However, in case of a two-party system it would be a much bigger failure, because such a prediction left the grounds of bipartisan systems.

Additionally, they apply a logarithm that reflects the non-linear development of the product when M and S are multiplied (as proven on numerous places by Taagepera and Shugart, 1993; Taagepera, 2007, pp. 115–164; Shugart and Taagepera, 2017, pp. 101–108). The logarithm straightens the trend what makes the values of d_{s_1} and d_{N_s} presented below more intuitive for interpretation. Finally, the analysis examines the results in their absolute values; as it aims to identify the influence of party system characteristics on the inability of an electoral system to deliver expected outcomes. Whether a system delivers outcomes which under or above a prediction is less relevant at this point.[6]

$$|d_{s_1}| = \log\left[s_1/(MS)^{-1/8}\right]$$

$$|d_{N_s}| = \log\left[N_s/(MS)^{1/6}\right]$$

Theoretically, the values of $|d_{s_1}|$ and $|d_{N_s}|$ can range from zero to infinity.[7] However, there are two arbitrary values that can help grasp the meaning of a value generated by the formulas specified above. The first one is *zero*. As has been already mentioned above, every electoral system expects at least some degree of voters' strategic coordination in response to the institutional constrains (Taagepera and Shugart, 1989; Cox, 1997). Therefore, if voters coordinate successfully,

[6] Transformation to absolute values is also motivated by practical reasons, since the use of non-transformed values would increase complexity of the analysis to unnecessary degree.

[7] Even though a value of d_{N_s} = 3 would already mean that there are 1,000 parties in a system for which the quantitatively predictive logical model predicts only one party.

real and predicted values are equal and the result of their division is one. That, after the logarithm is applied, gives zero. Therefore, when $|d_{s_1}|$ or $|d_{N_s}|$ is equal to *zero*, the voters' coordination resulted in electoral outcomes (i.e., party system fragmentation and largest party seat share) which perfectly meets the expectations based on the given set of electoral rules.

The second value is 0.3. This value signals that the real outcome stays within a factor of two from the prediction.[8] In other words, the real electoral outcome is half of the expected or twice the expected. If the value of $|d_{s_1}|$ or $|d_{N_s}|$ reaches 0.3, it indicates that voters elected as few as two or as many as eight parties to a system which institutional setup is expected to accommodate four parties.[9] Therefore, the voters' strategies did not properly respond to the incentives imposed by institutional constrains and resulted in a party system which is considerably less or considerably more fragmentated than expected. This value is set with respect to the empirical testing conducted by Taagepera (2007, pp. 123, 153), which revealed that most cases included in his dataset fall within this interval.

These values add a substantive meaning to the indices. At zero, they indicate that the real outcomes are perfectly consistent with the predictions. Increasing values of $|d_{s_1}|$ and $|d_{N_s}|$ indicate growing deviation between real and expected party systems fragmentation for the given set of electoral rules. However, the value of 0.3 limits the interval of "tolerable" deviations. If a value of $|d_{s_1}|$ or $|d_{N_s}|$ exceeds 0.3, it means that the case strongly deviates from theoretical expectations.

[8] To stay within a factor of two means that the result is within the interval bounded by numbers if the predicted value is multiplied or divided by two.

[9] It should be emphasized that these counts are effective numbers of parties which are quantities always smaller than the actual number of parties present in a system.

Operationalization of party systems' characteristics

Choice set size is a measure which sums up the number of all parties/candidates receiving at least one vote in a district based on the *Constituency-Level Elections Archive* (CLEA) (Kollman *et al.*, 2014).[10] However, the CLEA provides data on the level of constituencies, while this research operates on the level of individual national elections. Therefore, this research employs the aggregated measure which is a weighted average of the number of parties running in the districts with weights being the district magnitudes.

In response to this, a possible objection could be that the actual national number of parties should be used instead of weighted average, because it constitutes a more valid measure. That may be true for systems which apply similar district magnitudes across the country. However, the magnitude varies greatly in countries like Denmark (2 to 20), Spain (1 to 16), or Switzerland (1 to 18). In these cases, national number would overestimate the number of options offered in the districts with low magnitude where smaller parties resign to run. Weighted average reflects this and therefore constitutes a more suitable measure expressing the overall cognitive demands for voters in these elections. At the same time, weighted average produces comparable results to the actual national number of parties running in the elections, if the system applies comparable magnitude across its districts.

Degree of polarization is operationalized in three different ways which altogether utilize three out of four methods known in political science to position parties within a political space (Laver, 2014). The first approach takes the position of parties from the *Manifesto Project Database*

[10] I could not include candidates who received zero votes, because those are excluded from the CLEA dataset. Nevertheless, it is hard to imagine that the number of irrelevant candidates receiving zero votes could be high enough to result in a bias and alter the results.

(Lehmann *et al.*, 2017). It places the parties on the left-right dimension based on the saliency of specific issues in the parties' manifestos, which are analysed by trained coders who follow a strict methodology (see Budge *et al.*, 2001; Klingemann *et al.*, 2006). In this case, the degree of polarization is equal to the distance between the two most remote subjects[11] on the left-right (RILE) scale supplied directly by the Manifesto Project team (Budge *et al.*, 2001, p. 22). The theoretical range of this measure starts from zero (i.e., no polarization because the most distant parties occupy the same position) to 200 (i.e., extreme polarization, because the most distant parties occupy opposite edges of the RILE scale).[12]

The second measure captures the position of parties on the *general left-right scale* as they were coded by experts participating in the *Chapel Hill Expert Survey* (Hooghe *et al.*, 2010; Bakker *et al.*, 2012; Polk *et al.*, 2017). Given the fact that experts assess individual parties, also in this case the measure represents the distance between the two most remote parties. The theoretical range starts at zero (i.e., no polarization, because the most distant parties occupy the same position) and goes up to 10 (i.e., extreme polarization, because the most distant parties occupy opposite extremes of the *general left-right scale*).

[11] Degree of polarization could be computed from ideological position of parties in several ways: (1) distance between most extreme parties, (2) spatial distribution of parties measured by standard deviation, and (3) voter-weighted measures. Each approach has its own benefits and shortcomings. Nevertheless, Kim, Powell, and Fording (2010, p. 184) found out that when it comes to links between electoral systems, party systems, and ideological representation, all measures yield essentially the same results. Therefore, this research employs only one of the measures.

[12] Methodology of the Manifesto Project focuses on issue salience rather than party positions, therefore, validity of the RILE scale has been a subject of ongoing debates (e.g., Gabel and Huber, 2000; Laver and Garry, 2000; Dinas and Gemenis, 2010).

The third measure is the *Party System Polarization Index* proposed by Dalton (2008, 2010), which is based on the perception of party positions by voters captured in the *Comparative Study of Electoral Systems* (Dalton, 2017). Dalton's formula (2008) is designed in a way that captures the degree of polarization present in a given system, therefore no aggregation is needed in this case. Party System Polarization Index can range from 0 (i.e., no polarization) to 10 (i.e., fully polarized system).

Controls

The explanatory variables mentioned above are clearly not exogenous. Therefore, the regressions include a set of factors which control possible confounders.

In political science, district magnitude (i.e., the number of seats distributed in a district) is considered a key variable determining the effects of electoral systems (Rae, 1995). The growing number of seats divided among parties increases proportionality and fragmentation of electoral outcomes and changes the incentives for voters to cast their ballot strategically (i.e., for other than their sincere preference) in order to avoid wasting one's vote (Taagepera and Shugart, 1989; Cox and Shugart, 1996; Cox, 1997). Since the district magnitude may impact voters and subsequently electoral outcomes, the analysis controls for *average district magnitude* which is the number of assembly seats divided by the number of electoral districts for given elections in a country.

The longer the period spent under the democratic rules, the more learning opportunities voters have to familiarize the democratic institutions and act according to the strategic incentives the institutions generate (see e.g., Kitschelt, 1995; Aarts and Thomassen, 2008). This is the reason why the analysis controls for *democratic development* and *length of democratic tradition*. Both are based on the index of institutionalized democracy (i.e., e_democ) included in the V-Dem dataset

(Coppedge *et al.*, 2018), which ranges from 0 (least democratic) to 10 (most democratic) and reflects the Polity IV data. The *democratic development* uses the respective value for the election year in a country. The *length of democratic tradition* counts the number of years before the election during which the index was six or higher.

Several scholars claim that the resulting fragmentation of party systems is conditional on social cleavages present in a country (Ordeshook and Shvetsova, 1994; Neto and Cox, 1997; Clark and Golder, 2006; Golder and Lloyd, 2014). Therefore, the models include the index of *ethnic fractionalization* developed by Alesina et al. (2003) who transform the data from the Encyclopædia Britannica into an overall measure for 215 countries which range in theory from 0 (ethnically homogeneous country) to 1 (ethnically heterogeneous country).

Clarke et al. (1999) and Norris (2004) noticed that the economic situation has an influence over the cleavage voting in countries. The reason is that the level of economic development determines the shift from industrial to postindustrial stage. Therefore, the analysis controls also for the *GDP per capita* as reported by the Maddison Project Database (2018) included in the V-Dem data (as variable "e_migdppc") (Coppedge *et al.*, 2018).

The analysis employs regression with clustered robust standard errors (clusters being the countries), which is supposed to reduce the bias resulting from the fact that the available data often includes multiple elections from one country (see Online appendix A for list of included elections).

Analysis

This analysis first examines the effect of choice set size, i.e., the number of options provided to voters during elections. The results presented in table 1 show that the coefficients for the choice set size are positive and highly statistically significant. These results are robust to the inclusion of

the control variables (see models 2 and 4 in table 1) and their alternative operationalizations (see table B.1 and B.2 in online appendix B). This confirms the choice set size hypothesis which expect that an increasing number of options provided to voters causes the fragmentation in electoral outcomes to deviate from theoretical expectations to a greater degree. However, the effect is non-linear. The most suitable function capturing the trend in the data is a natural logarithm, which means that every additional option included on the ballot has a smaller effect when the overall size of the ballot increases. The trendline for $|d_{s_1}|$ and $|d_{N_s}|$ is visualized in figure 2.

Table 1. The effect of increasing choice set size on fragmentation of electoral outcomes

	Dependent variable:			
	$\|d_{s_1}\|$		$\|d_{N_s}\|$	
	(1)	(2)	(3)	(4)
Weighted average number of options (ln)	0.034***	0.038***	0.039***	0.046***
	(0.010)	(0.013)	(0.012)	(0.014)
Average district magnitude		-0.0003		-0.0003*
		(0.0002)		(0.0002)
Democratic development		0.001		-0.008
		(0.006)		(0.006)
Length of democratic tradition		-0.0001		0.0001
		(0.0002)		(0.0003)
GDP per capita		-0.00000		-0.00000
		(0.00000)		(0.00000)
Ethnic fractionalization (Alesina *et al.*, 2003)		0.009		0.010
		(0.049)		(0.057)
Constant	0.021	0.035	0.018	0.093
	(0.020)	(0.068)	(0.027)	(0.071)
Observations	221	221	221	221
R^2	0.129	0.173	0.160	0.208
Adjusted R^2	0.125	0.149	0.156	0.185

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

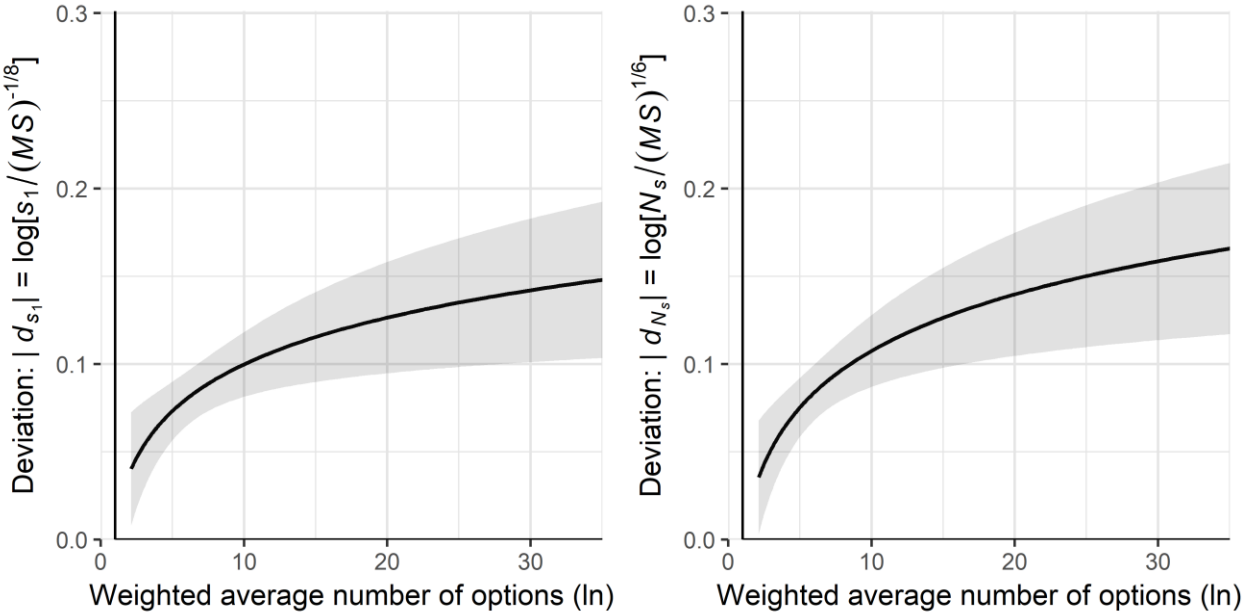
These results demonstrate that the choice set size of ten is already associated with a deviation of roughly 0.1 for both $|d_{s_1}|$ and $|d_{N_s}|$. Substantively speaking, this means that in the systems for which the largest party seat share is predicted to be 40%, the largest party tends to get about 32% or 50% seats instead when voters are provided with ten options. In case of effective number of parties, systems which are supposed to consist of five parties tend to include four or 6.25 effective parties instead if the choice set size is ten.[13] Given the natural log transformation of the choice set size, its effect slows down after surpassing the value ten (see figure 2). When the choice set size increases and voters are offered 30 options, the deviation expressed by indices $|d_{s_1}|$ and $|d_{N_s}|$ also increases to about 0.15. This means that if a system is predicted to include largest party with a seat share of 40%, the choice set size of 30 tend to divert this share to around 28% or 56%. When it comes to the effective number of parties, such a system tends to contain 3.5 or seven effective parties instead of the predicted value of five. These interpretations demonstrate that increasing choice set size influence the shape of party systems and contribute to their diversion from theoretically expected outcomes.

This finding is in line with the studies focused on individuals (i.e., on the micro level), which discovered that an increasing choice set size increases cognitive demands for voters and results in a growing confusion (Lau, Andersen and Redlawsk, 2008; Cunow, 2014; O'Brien, 2017). The consequences of this confusion could also be observed on the level of the whole system: If voters are offered too many options, their ability to strategically coordinate in line with the

[13] Here it should be emphasized again that these values represent effective number of parties which is always smaller than the actual number of parties in a system. Therefore, the differences in counts of parties would be even larger.

expectations of electoral system designers decreases and the fragmentation in electoral outcomes is further away from what a typical outcome is for a given set of electoral rules.

Figure 2. Visualization of the effect of increasing choice set size on fragmentation of electoral outcomes



Now, the analysis turns to the second part. It examines the indirect influence of party system polarization on electoral outcomes. As previously noted in the theoretical part, increasing polarization (while keeping the number of parties constant) should expand the ideological differences between candidates, which makes it easier for voters to distinguish candidates taking part in the same political competition (Cox, 1997; Persson and Tabellini, 2005). Therefore, increasing polarization should reduce the cognitive demands for voter coordination and simplify the competent response to the strategic incentive generated by an electoral system. As mentioned

above, the effect of polarization expects that the number of parties is kept constant, therefore, each measure of party system polarization is always included in the regression models 5 to 16 together with weighted choice set size (see table 2).

The coefficients capturing the effect of polarization are mostly negative, which is in line with the expectations, however, none of them passes the threshold for statistical significance (see table 2). Therefore, these findings do not support the polarization hypothesis that increasing polarization helps voters to follow the political competition and to more efficiently respond to strategic incentives generated by the electoral system.

It can be argued that political science has several competing concepts of ideological polarization. Indeed. This research employed three out of four methodological approaches to measure ideological polarization (see Laver, 2014) and revealed pairwise correlations ranging between r=0.34 and r=0.60.[14] This indicates that all three measures conceptually overlap to only some degree, yet none of them capture any systematic influence of party system polarization on the overall degree of electoral fragmentation on the macro level.

[14] The correlations are r = 0.34 for Party System Polarization Index vs. Manifesto Project, r = 0.35 for Party System Polarization Index vs. Chapel Hill Expert Survey, and r = 0.60 for Manifesto Project vs. Chapel Hill Expert Survey. All correlations are statistically significant at $p<0.01$.

Table 2. The effect of increasing choice set size on fragmentation of electoral outcomes when polarization is kept constant

	Dependent variable:											
	$\lvert d_{s_1} \rvert$		$\lvert d_{N_s} \rvert$		$\lvert d_{s_1} \rvert$		$\lvert d_{N_s} \rvert$		$\lvert d_{s_1} \rvert$		$\lvert d_{N_s} \rvert$	
	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Manifesto Project	-0.0001	0.0002	-0.0003	-0.00002								
	(0.0004)	(0.0003)	(0.0004)	(0.0004)								
Chapel Hill Expert Survey					-0.005	-0.009	-0.008	-0.005				
					(0.010)	(0.011)	(0.008)	(0.007)				
Party System Polarization Index									-0.007	-0.006	-0.015	-0.013
									(0.014)	(0.015)	(0.014)	(0.015)
Weighted average number of options (ln)	0.039***	0.041***	0.041***	0.047***	0.025***	0.027***	0.026***	0.031***	0.041***	0.051***	0.051***	0.054***
	(0.012)	(0.015)	(0.014)	(0.016)	(0.009)	(0.010)	(0.008)	(0.009)	(0.015)	(0.013)	(0.017)	(0.018)
Average district magnitude		-0.0004		-0.0003		0.0003**		-0.0001		0.00000		-0.0001
		(0.0003)		(0.0002)		(0.0001)		(0.0001)		(0.0002)		(0.0003)
Democratic development		0.002		-0.006		-0.001		0.028		0.026*		0.006
		(0.007)		(0.006)		(0.022)		(0.023)		(0.014)		(0.014)
Length of democratic tradition		-0.0002		0.0001		0.0001		0.00002		0.0004		0.0002
		(0.0002)		(0.0003)		(0.0002)		(0.0003)		(0.0003)		(0.0003)
GDP per capita		-0.00000		-0.00000		-0.00000		0.00000		-0.00000*		-0.00000
		(0.00000)		(0.00000)		(0.00000)		(0.00000)		(0.00000)		(0.00000)
Ethnic fractionalization (Alesina *et al.*, 2003)		0.010		0.010		-0.043		0.045		0.067		0.118
		(0.049)		(0.056)		(0.076)		(0.073)		(0.083)		(0.083)
Constant	0.019	0.014	0.026	0.080	0.062	0.090	0.078	-0.240	0.013	-0.238	0.028	-0.049
	(0.025)	(0.070)	(0.032)	(0.076)	(0.068)	(0.240)	(0.053)	(0.228)	(0.047)	(0.153)	(0.049)	(0.162)
Observations	211	211	211	211	52	52	52	52	55	55	55	55
R^2	0.140	0.177	0.156	0.194	0.120	0.160	0.137	0.192	0.158	0.296	0.237	0.367
Adjusted R^2	0.131	0.149	0.148	0.166	0.084	0.026	0.101	0.064	0.126	0.191	0.208	0.272

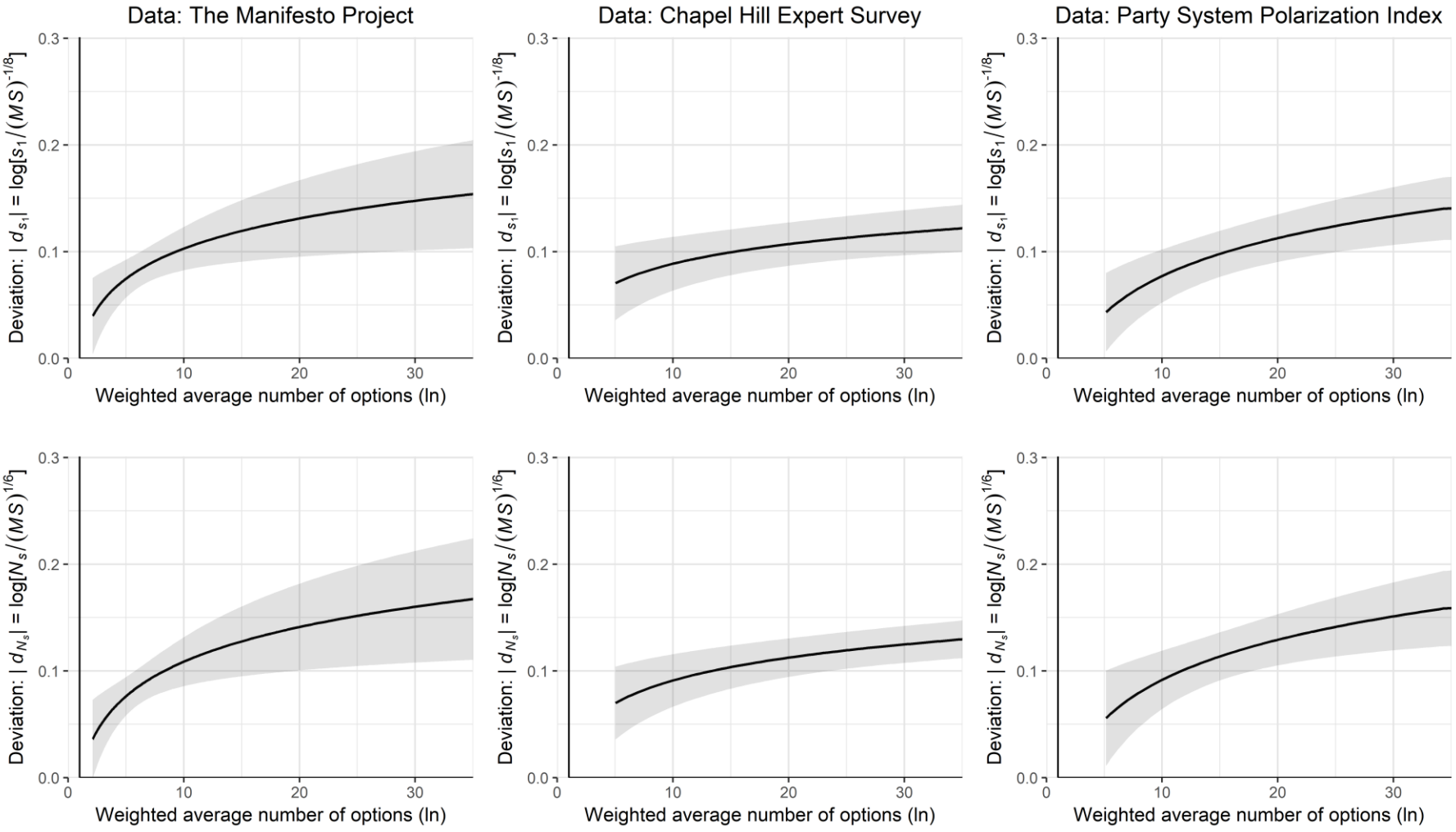
Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

In addition, measures of ideological polarization included in regression models 5 to 16 allow to examine the effect of choice set size when polarization is kept constant. All coefficients for choice set size are still statistically significant and robust to the inclusion of the control variables (see table 2).[15] Moreover, the values as well as the trendlines visualizing the effect of choice set size are comparable to the results obtained through models 1 to 4 (see figures 2 and 3). Therefore, the substantive interpretation of the effect of choice set size presented in the previous part of the analysis can be applied here as well.

This indicates that the influence of choice set size is comparable even when the degree of ideological polarization of party systems as well as other possible confounders are held constant. Thus, robustness of the results supporting the choice set size hypothesis allows to conclude that the choice set size constitutes a relevant factor influencing the performance of electoral systems on the macro level.

[15] Results remain the same even when the alternative operationalization of control variables is used (see tables B.3 through B.8 in Online appendix B). In addition to that, this part of the analysis also confirms the negligible impact of potential confounders included in the models.

Figure 3. Visualization of the (limited) effect of polarization on the relationship between choice set size and fragmentation of electoral outcomes



Discussion and conclusions

This paper confirmed that parties can not only *directly* adjust the electoral rules to reach more favourable outcomes, but they also create a context that *indirectly* and systematically influences electoral competition. This conceptual framework constitutes an original theoretical contribution to the relationship between parties and electoral systems. It emphasizes that any expectations of electoral reforms and any comparisons of electoral systems across various contexts must reflect the specific features of the local party system.

This research examined two factors that capture attributes related to party systems – choice set size and degree of ideological polarization. These factors represent two different approaches describing party systems – quantitative and qualitative. Based on a range of acknowledged measures and data from several credible sources, this research reaches two main conclusions.

First, increasing the options provided to voters (i.e., choice set size) increases the cognitive demands on them to comprehend the political competition (Lau, Andersen and Redlawsk, 2008; Cunow, 2014; O'Brien, 2017). As a result, systems with too many parties/candidates experience greater fragmentation in electoral outcomes than is expected from the given set of electoral rules.

This conclusion constitutes a relevant finding for the designers of electoral systems. When the outcomes of an electoral reform are estimated, it is also necessary to take into account the costs to enter a political competition. If costs are too low and marginal parties are not effectively restricted from running, the cognitive demands to follow the political competition increase. As a result, a growing number of voters fail to competently respond to strategic incentives generated by electoral rules and therefore the number of parties receiving the substantial portion of votes will be further away from the theoretically expected value.

Second, none of the three different approaches to measuring the party system polarization revealed that the range of ideological space occupied by parties have a systematic impact on electoral systems and their outcomes. However, it must be emphasized that these results do not challenge the conclusions based on micro level observations of individuals (Lau and Redlawsk, 1997; Lau *et al.*, 2014; O'Brien, 2017). Polarization can still represent a relevant force driving an individual's perception of politics, however, on the macro level, the effect of polarization does not seem to be a factor strong enough to substantively alter the overall fragmentation of electoral results in a country.

Future research should aim to quantify the magnitude of impact of choice set size on resulting electoral fragmentation. Based on that, it should develop a rigorous methodological tool which would allow to take into consideration how choice set size influence performance of various electoral systems. This instrument will significantly increase the accuracy when impact of electoral reforms is estimated.

References

Aarts, K. and Thomassen, J. (2008) 'Satisfaction with democracy: Do institutions matter?', *Electoral Studies*, 27(1), pp. 5–18. doi: 10.1016/j.electstud.2007.11.005.

Adams, J. (2012) 'Causes and Electoral Consequences of Party Policy Shifts in Multiparty Elections: Theoretical Results and Empirical Evidence', *Annual Review of Political Science*, 15(1), pp. 401–419. doi: 10.1146/annurev-polisci-031710-101450.

Alesina, A. *et al.* (2003) 'Fractionalization', *Journal of Economic Growth*, 8(2), pp. 155–194. doi: 10.1023/A:1024471506938.

Bakker, R. *et al.* (2012) 'Measuring party positions in Europe: The Chapel Hill expert survey trend file, 1999-2010', *Party Politics*, 21(1), pp. 1–15. doi: 10.1177/1354068812462931.

Banducci, S. A., Karp, J. A. and Vowles, J. (1998) 'Vote splitting under MMP', in Vowles, J. et al. (eds) *Voters' Victory? New Zealand's First Election Under Proportional Representation*. Auckland: Auckland University Press, pp. 101–119.

Bawn, K. (1999) 'Voter Responses to Electoral Complexity: Ticket Splitting, Rational Voters and Representation in the Federal Republic of Germany', *British Journal of Political Science*, 29(3), pp. 487–505. doi: 10.1017/S0007123499000228.

Blais, A. (2006) 'What Affects Voter Turnout?', *Annual Review of Political Science*, 9(1), pp. 111–125. doi: 10.1146/annurev.polisci.9.070204.105121.

Blais, A. and Aarts, K. (2006) 'Electoral Systems and Turnout', *Acta Politica*, 41(2), pp. 180–196. doi: 10.1057/palgrave.ap.5500148.

Blondel, J. (1968) 'Party Systems and Patterns of Government in Western Democracies', *Canadian Journal of Political Science*, 1(2), pp. 180–203. doi: 10.1017/S0008423900036507.

Blondel, J. (1990) 'Types of Party Systems', in Mair, P. (ed.) *The West European Party*

System. Oxford: Oxford University Press, pp. 302–310.

Bowler, S. and Donovan, T. (2013) *The Limits of Electoral Reform*. Oxford: Oxford University Press. doi: 10.1093/acprof:oso/9780199695409.001.0001.

Budge, I. *et al.* (2001) *Mapping Policy Preferences. Estimates for Parties, Electors, and Governments 1945-1998*. Oxford: Oxford University Press.

Carey, J. M. and Hix, S. (2011) 'The Electoral Sweet Spot: Low-Magnitude Proportional Electoral Systems', *American Journal of Political Science*, 55(2), pp. 383–397. doi: 10.1111/j.1540-5907.2010.00495.x.

Clark, W. R. and Golder, M. (2006) 'Rehabilitating Duverger's Theory: Testing the Mechanical and Strategic Modifying Effects of Electoral Laws', *Comparative Political Studies*, 39(6), pp. 679–708. doi: 10.1177/0010414005278420.

Clarke, H. D. *et al.* (1999) 'The Effect of Economic Priorities on the Measurement of Value Change: New Experimental Evidence', *American Political Science Review*, 93(3), pp. 637–647. doi: 10.2307/2585579.

Colomer, J. M. (2005) 'It's Parties that Choose Electoral Systems (Or, Duverger's Laws Upside Down)', *Political Studies*, 53(1), pp. 1–21. doi: 10.1111/j.1467-9248.2005.00514.x.

Colomer, J. M. (2018) 'Party System Effects on Electoral Systems', in Herron, E. S., Pekkanen, R. J., and Shugart, M. S. (eds) *The Oxford Handbook of Electoral Systems*. Oxford: Oxford University Press, pp. 70–84. doi: 10.1093/oxfordhb/9780190258658.013.16.

Coppedge, M. *et al.* (2018) 'V-Dem [Country-Year/Country-Date] Dataset v8'. Varieties of Democracy (V-Dem) Project. doi: 10.23696/vdemcy18.

Cox, G. W. (1990) 'Centripetal and Centrifugal Incentives in Electoral Systems Published by: Midwest Political Science Association Centripetal and Centrifugal Incentives in

Electoral Systems *', *American Journal of Political Science*, 34(4), pp. 903–935.

Cox, G. W. (1997) *Making Votes Count*. New York: Cambridge University Press. doi: 10.1002/ncr.4100520906.

Cox, G. W. and Shugart, M. S. (1996) 'Strategic Voting Under Proportional Representation', *Journal of Law, Economics, and Organization*, 12(2), pp. 299–324. doi: 10.1093/oxfordjournals.jleo.a023365.

Cox, K. E. and Schoppa, L. J. (2002) 'Interaction Effects in Mixed-Member Electoral Systems: Theory and Evidence From Germany, Japan, and Italy', *Comparative Political Studies*, 35(9), pp. 1027–1053. doi: 10.1177/001041402237505.

Cunow, S. F. (2014) *Vote Choice in Complex Electoral Environments*. University of California, San Diego. Available at: https://escholarship.org/uc/item/87r237wc.

Curini, L. and Hino, A. (2012) 'Missing links in party-system polarization: How institutions and voters matter', *Journal of Politics*, 74(2), pp. 460–473. doi: 10.1017/S0022381611001721.

Dalton, R. J. (2008) 'The quantity and the quality of party systems: Party system polarization, its measurement, and its consequences', *Comparative Political Studies*, 41(7), pp. 899–920. doi: 10.1177/0010414008315860.

Dalton, R. J. (2010) 'Left–Right Orientations, Context, and Voting Choices', in Dalton, R. J. and Anderson, C. J. (eds) *Citizens, Context, and Choice: How Context Shapes Citizens' Electoral Choices*. Oxford: Oxford University Press, pp. 103–122. doi: 10.1093/acprof:oso/9780199599233.003.0005.

Dalton, R. J. (2017) 'Party System Polarization Index for CSES Modules 1-4'. Comparative Study of Electoral Systems. Available at:

http://www.cses.org/datacenter/usercommunity3/usercommunity3.htm.

Dinas, E. and Gemenis, K. (2010) 'Measuring parties' ideological positions with manifesto data: A critical evaluation of the competing methods', *Party Politics*, 16(4), pp. 427–450. doi: 10.1177/1354068809343107.

Dow, J. K. (2011) 'Party-System Extremism in Majoritarian and Proportional Electoral Systems', *British Journal of Political Science*, 41(2), pp. 341–361. doi: 10.1017/s0007123410000360.

Duverger, M. (1954) *Political Parties: Their Organization and Activity in the Modern State*. Second edi. London, New York: Methuen & Co. ltd; John Wiley & Sons, Inc.

Ezrow, L. (2010) *Linking Citizens and Parties: How Electoral Systems Matter for Political Representation*. Oxford: Oxford University Press. doi: 10.1093/acprof:oso/9780199572526.001.0001.

Farrell, D. M. (2010) 'Reforming electoral system is not going to be enough', *The Irish Times*. Available at: http://www.irishtimes.com/opinion/reforming-electoral-system-is-not-going-to-be-enough-1.616217.

Franklin, M. N. (2004) *Voter Turnout and the Dynamics of Electoral Competition since 1945*. Cambridge: Cambridge University Press.

Gabel, M. J. and Huber, J. D. (2000) 'Putting Parties in Their Place: Inferring Party Left-Right Ideological Positions from Party Manifestos Data', *American Journal of Political Science*, 44(1), p. 94. doi: 10.2307/2669295.

Geys, B. (2006) 'Explaining voter turnout: A review of aggregate-level research', *Electoral Studies*, 25(4), pp. 637–663. doi: 10.1016/j.electstud.2005.09.002.

Golder, M. and Lloyd, G. (2014) 'Re-evaluating the relationship between electoral rules

and ideological congruence', *European Journal of Political Research*, 53(1), pp. 200–212. doi: 10.1111/1475-6765.12031.

Grofman, B. and Selb, P. (2011) 'Turnout and the (effective) number of parties at the national and district levels: A puzzle-solving approach', *Party Politics*, 17(1), pp. 93–117. doi: 10.1177/1354068810365506.

Gschwend, T., Johnston, R. and Pattie, C. J. (2003) 'Split-ticket patterns in mixed-member proportional election systems: estimates and analyses of their spatial variation at the German Federal Election, 1998', pp. 109–127. doi: 10.1017/S000712340300005X.

Hooghe, L. *et al.* (2010) 'Reliability and validity of the 2002 and 2006 Chapel Hill expert surveys on party positioning', *European Journal of Political Research*, 49(5), pp. 687–703. doi: 10.1111/j.1475-6765.2009.01912.x.

Iyengar, S. S. and Kamenica, E. (2010) 'Choice proliferation, simplicity seeking, and asset allocation', *Journal of Public Economics*, 94(7–8), pp. 530–539. doi: 10.1016/j.jpubeco.2010.03.006.

Iyengar, S. S. and Lepper, M. R. (2000) 'When choice is demotivating: Can one desire too much of a good thing?', *Journal of Personality and Social Psychology*, 79(6), pp. 995–1006. doi: 10.1037//0022-3514.79.6.995.

Karp, J. A. (2006) 'Political knowledge about electoral rules: Comparing mixed member proportional systems in Germany and New Zealand', *Electoral Studies*, 25(4), pp. 714–730. doi: 10.1016/j.electstud.2005.11.002.

Karp, J. A. (2012) 'Electoral Systems, Party Mobilisation and Political Engagement', *Australian Journal of Political Science*, 47(1), pp. 71–89. doi: 10.1080/10361146.2011.643165.

Karp, J. A. and Banducci, S. A. (2008) 'Political efficacy and participation in twenty-

seven democracies: How electoral systems shape political behaviour', *British Journal of Political Science*, 38(2), pp. 311–334. doi: 10.1017/S0007123408000161.

Kim, H., Powell, Jr., G. B. and Fording, R. C. (2010) 'Electoral Systems, Party Systems, and Ideological Representation: An Analysis of Distortion in Western Democracies', *Comparative Politics*, 42(2), pp. 167–185. doi: 10.5129/001041510X12911363509477.

Kitschelt, H. (1995) 'Formation of Party Cleavages in Post-Communist Democracies: Theoretical Propositions', *Party Politics*, 1(4), pp. 447–472. doi: 10.1177/1354068895001004002.

Klingemann, H.-D. *et al.* (2006) *Mapping Policy Preferences II. Estimates for Parties, Electors, and Governments in Eastern Europe, the European Union and the OECD, 1990-2003*. Oxford: Oxford University Press.

Kollman, K. *et al.* (2014) 'Constituency-Level Elections Archive'. Ann Arbor: Center for Political Studies, University of Michigan. Available at: http://www.electiondataarchive.org/.

Laakso, M. and Taagepera, R. (1979) '"Effective" Number of Parties: A Measure with Application to West Europe', *Comparative Political Studies*, 12(1), pp. 3–27.

Lau, R. R. *et al.* (2014) 'Correct Voting Across Thirty-Three Democracies: A Preliminary Analysis', *British Journal of Political Science*, 44(2), pp. 239–259. doi: 10.1017/S0007123412000610.

Lau, R. R., Andersen, D. J. and Redlawsk, D. P. (2008) 'An Exploration of Correct Voting in Recent U.S. Presidential Elections', *American Journal of Political Science*, 52(2), pp. 395–411.

Lau, R. R. and Redlawsk, D. P. (1997) 'Voting Correctly', *American Political Science Review*, 91(03), pp. 585–598. doi: 10.2307/2952076.

Lau, R. R. and Redlawsk, D. P. (2001) ‘Advantages and Disadvantages of Cognitive Heuristics in Political Decision Making’, *American Journal of Political Science,* 45(4), pp. 951–971. doi: 10.2307/2669334.

Laver, M. (2014) ‘Measuring Policy Positions in Political Space’, *Annual Review of Political Science,* 17(1), pp. 207–223. doi: doi:10.1146/annurev-polisci-061413-041905.

Laver, M. and Garry, J. (2000) ‘Estimating Policy Positions from Political Texts’, *American Journal of Political Science,* 44(3), pp. 619–634. doi: 10.2307/2669268.

Lehmann, P. *et al.* (2017) ‘The Manifesto Data Collection. Manifesto Project (MRG/CMP/MARPOR). Version 2017a.’ Berlin: Wissenschaftszentrum Berlin für Sozialforschung (WZB). doi: 10.25522/manifesto.mpds.2017a.

Li, Y. and Shugart, M. S. (2016) ‘The Seat Product Model of the Effective Number of Parties: A Case for Applied Political Science’, *Electoral Studies*. Elsevier Ltd, 41, pp. 23–34. doi: 10.1016/j.electstud.2015.10.011.

Lijphart, A. (1999) *Patterns of Democracy: Government Forms and Performance in Thirty-six Countries*. First edit. New Heaven: Yale University Press.

Lijphart, A. (2012) *Patterns of democracy: Government forms and performance in thirty-six countries*. Second edi. New Haven: Yale University Press.

Lijphart, A. and Grofman, B. (1984) ‘Choosing an Electoral System’, in Lijphart, A. and Grofman, B. (eds) *Choosing an Electoral System: Issues and Alternatives*. New York: Praeger Publishers, pp. 3–12.

Maddison Project Database *et al.* (2018) ‘Rebasing “Maddison”: new income comparisons and the shape of long-run economic development’. Available at: https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-

2018.

Muraoka, T. and Barceló, J. (2017) 'The effect of district magnitude on turnout', *Party Politics*, (October), pp. 1–8. doi: 10.1177/1354068817740337.

Nemčok, M. and Šedo, J. (2018) 'Theoretical Expectations and Actual Outcomes of Electoral Systems: How to Measure the Size of the Deviation?', *World Political Science*, 14(2), pp. 189–212. doi: 10.1515/wps-2018-0008.

Neto, O. A. and Cox, G. W. (1997) 'Electoral Institutions, Cleavage Structures, and the Number of Parties', *American Journal of Political Science*, 41(1), p. 149. doi: 10.2307/2111712.

Norris, P. (2004) *Electoral Engineering: Voting Rules and Political Behavior*. Cambridge: Cambridge University Press.

O'Brien, K. (2017) *Political Choices: The effect of additional parties on voter decision-making in the UK*. University College London. Available at: http://discovery.ucl.ac.uk/1542200/.

Ordeshook, P. C. and Shvetsova, O. V. (1994) 'Ethnic Heterogeneity , District Magnitude , and the Number of Parties Author', *American Journal of Political Science*, 38(1), pp. 100–123.

Persson, T. and Tabellini, G. (2005) *The Economic Effects of Constitutions*. Cambridge: MIT Press.

Polk, J. *et al.* (2017) 'Explaining the salience of anti-elitism and reducing political corruption for political parties in Europe with the 2014 Chapel Hill Expert Survey data', *Research & Politics*, 4(1), pp. 1–9. doi: 10.1177/2053168016686915.

Powell, G. B. J. (2000) *Elections as Instruments of Democracy: Majoritarian and Proportional Visions*. New Heaven: Yale University Press.

Powell, G. B. J. and Vanberg, G. S. (2000) 'Election Laws, Disproportionality and Median Correspondence: Implications for Two Visions of Democracy', *British Journal of*

Political Science, 30(3), pp. 383–411.

Rae, D. W. (1995) 'Using District Magnitude to Regulate Political Party Competition', *Journal of Economic Perspectives*, 9(1), pp. 65–75. doi: 10.1257/jep.9.1.65.

Rokkan, S. (1968) 'ELECTIONS: Electoral Systems', in Sills, D. L. (ed.) *International Encyclopedia of the Social Science*. The Macmillan Company & The Free Press, pp. 6–21.

Sartori, G. (1976) *Parties and Party Systems: A Framework for Analysis*. London, New York, Melbourne: Cambridge University Press.

Sartori, G. (1997) *Comparative Constitutional Engineering: An Inquiry into Structures, Incentives and Outcomes*. Second. Basingstoke: MacMillan Press.

Schwartz, B. *et al.* (2002) 'Maximizing versus satisficing: Happiness is a matter of choice.', *Journal of Personality and Social Psychology*, 83(5), pp. 1178–1197. doi: 10.1037//0022-3514.83.5.1178.

Shugart, M. S. (2005) 'Comparative Electoral Systems Research: The Maturation of a Field and New Challenges Ahead', in Gallagher, M. and Mitchell, P. (eds) *The Politics of Electoral Systems*. Oxford: Oxford University Press, pp. 25–56. doi: 10.1093/0199257566.003.0002.

Shugart, M. S. and Taagepera, R. (2017) *Votes from Seats: Logical Models of Electoral Systems*. Cambridge: Cambridge University Press.

Shugart, M. S. and Taagepera, R. (2018) 'Electoral System Effects on Party Systems', in Herron, E. S., Pekkanen, R. J., and Shugart, M. S. (eds) *Oxford Handbook of Electoral Systems*. Oxford: Oxford University Press, pp. 42–69. doi: 10.1093/oxfordhb/9780190258658.013.15.

Shugart, M. S. and Wattenberg, M. P. (2003) 'Conclusion: Are Mixed-Member Systems the Best of Both Worlds?', in Shugart, M. S. and Wattenberg, M. P. (eds) *Mixed-Member*

Electoral Systems. Oxford: Oxford University Press, pp. 571–596. doi: 10.1093/019925768X.003.0026.

Taagepera, R. (2003) 'Arend Lijphart's Dimensions of Democracy: Logical Connections and Institutional Design', *Political Studies*, 51(1), pp. 1–19. doi: 10.1111/1467-9248.00409.

Taagepera, R. (2007) *Predicting party sizes: the logic of simple electoral systems*. New York: Oxford University Press.

Taagepera, R. (2018) 'Science walks on two legs, but social sciences try to hop on one', *International Political Science Review*, 39(1), pp. 145–159. doi: 10.1177/0192512116682185.

Taagepera, R., Selb, P. and Grofman, B. (2014) 'How Turnout Depends on the Number of Parties: A Logical Model', *Journal of Elections, Public Opinion and Parties*. Taylor & Francis, 24(4), pp. 393–413. doi: 10.1080/17457289.2013.858345.

Taagepera, R. and Shugart, M. S. (1989) *Seats and votes: the effects and determinants of electoral systems*. New Heaven: Yale University Press.

Taagepera, R. and Shugart, M. S. (1993) 'Predicting the Number of Parties: A Quantitative Model of Duverger's Mechanical Effect', *American Political Science Review*, 87(2), pp. 455–464.

Online appendix A

Table A.1. Cases included in the analysis

Choice Set Size	Manifestos Project	Chapel Hill Expert Survey	Party System Polarization Index
Armenia 2007	Armenia 2007		
Armenia 2012	Armenia 2012		
Australia 1946	Australia 1946		
Australia 1949	Australia 1949		
Australia 1951	Australia 1951		
Australia 1954	Australia 1954		
Australia 1955	Australia 1955		
Australia 1958	Australia 1958		
Australia 1961	Australia 1961		
Australia 1963	Australia 1963		
Australia 1966	Australia 1966		
Australia 1969	Australia 1969		
Australia 1972	Australia 1972		
Australia 1974	Australia 1974		
Australia 1975	Australia 1975		
Australia 1977	Australia 1977		
Australia 1980	Australia 1980		
Australia 1983	Australia 1983		
Australia 1984	Australia 1984		
Australia 1987	Australia 1987		
Australia 1990	Australia 1990		
Australia 1993	Australia 1993		
Australia 1996	Australia 1996		Australia 1996
Australia 1998	Australia 1998		
Australia 2001	Australia 2001		
Australia 2004	Australia 2004		Australia 2004
Australia 2007	Australia 2007		Australia 2007
Australia 2010	Australia 2010		
Australia 2013	Australia 2013		Australia 2013
Bulgaria 1991	Bulgaria 1991		
Bulgaria 1994	Bulgaria 1994		
Bulgaria 1997	Bulgaria 1997		
Bulgaria 2001	Bulgaria 2001	Bulgaria 2001	Bulgaria 2001
Bulgaria 2005	Bulgaria 2005	Bulgaria 2005	
Bulgaria 2009	Bulgaria 2009	Bulgaria 2009	
Bulgaria 2013	Bulgaria 2013	Bulgaria 2013	
Bulgaria 2014		Bulgaria 2014	Bulgaria 2014
Canada 1945	Canada 1945		

Choice Set Size	Manifestos Project	Chapel Hill Expert Survey	Party System Polarization Index
Canada 1949	Canada 1949		
Canada 1953	Canada 1953		
Canada 1957	Canada 1957		
Canada 1958	Canada 1958		
Canada 1962	Canada 1962		
Canada 1963	Canada 1963		
Canada 1965	Canada 1965		
Canada 1968	Canada 1968		
Canada 1972	Canada 1972		
Canada 1974	Canada 1974		
Canada 1979	Canada 1979		
Canada 1980	Canada 1980		
Canada 1984	Canada 1984		
Canada 1988	Canada 1988		
Canada 1993	Canada 1993		
Canada 1997	Canada 1997		Canada 1997
Canada 2000	Canada 2000		
Canada 2004	Canada 2004		Canada 2004
Canada 2006	Canada 2006		
Canada 2008	Canada 2008		Canada 2008
Canada 2011	Canada 2011		Canada 2011
Canada 2015	Canada 2015		
Croatia 2007	Croatia 2007		Croatia 2007
Czech Republic 1990	Czech Republic 1990		
Czech Republic 1992	Czech Republic 1992		
Czech Republic 1996	Czech Republic 1996		Czech Republic 1996
Czech Republic 1998	Czech Republic 1998		
Czech Republic 2002	Czech Republic 2002	Czech Republic 2002	Czech Republic 2002
Czech Republic 2006	Czech Republic 2006	Czech Republic 2006	Czech Republic 2006
Czech Republic 2010	Czech Republic 2010	Czech Republic 2010	Czech Republic 2010
Czech Republic 2013	Czech Republic 2013	Czech Republic 2013	Czech Republic 2013
Denmark 2001	Denmark 2001	Denmark 2001	Denmark 2001
Denmark 2005	Denmark 2005	Denmark 2005	
Denmark 2007	Denmark 2007	Denmark 2007	Denmark 2007
Denmark 2011	Denmark 2011	Denmark 2011	
Denmark 2015		Denmark 2015	
Estonia 1992	Estonia 1992		
Estonia 1995	Estonia 1995		
Estonia 1999	Estonia 1999		
Estonia 2003	Estonia 2003		

Choice Set Size	Manifestos Project	Chapel Hill Expert Survey	Party System Polarization Index
Estonia 2007	Estonia 2007	Estonia 2007	
Estonia 2011	Estonia 2011	Estonia 2011	Estonia 2011
Estonia 2015	Estonia 2015	Estonia 2015	
Finland 1999	Finland 1999	Finland 1999	
Finland 2003	Finland 2003	Finland 2003	Finland 2003
Finland 2007	Finland 2007	Finland 2007	Finland 2007
Finland 2011	Finland 2011	Finland 2011	Finland 2011
Finland 2015		Finland 2015	Finland 2015
France 1986	France 1986		
France 2007	France 2007	France 2007	France 2007
France 2012	France 2012	France 2012	France 2012
Ireland 2002	Ireland 2002	Ireland 2002	Ireland 2002
Ireland 2007	Ireland 2007	Ireland 2007	Ireland 2007
Ireland 2011	Ireland 2011	Ireland 2011	Ireland 2011
Israel 1951	Israel 1951		
Israel 1955	Israel 1955		
Israel 1959	Israel 1959		
Israel 1961	Israel 1961		
Israel 1965	Israel 1965		
Israel 1969	Israel 1969		
Israel 1973	Israel 1973		
Israel 1977	Israel 1977		
Israel 1981	Israel 1981		
Israel 1984	Israel 1984		
Israel 1988	Israel 1988		
Israel 1992	Israel 1992		
Israel 1996	Israel 1996		Israel 1996
Israel 1999	Israel 1999		
Israel 2003	Israel 2003		Israel 2003
Israel 2006			Israel 2006
Israel 2009			
Israel 2013			Israel 2013
Israel 2015	Israel 2015		
Japan 1960	Japan 1960		
Japan 1963	Japan 1963		
Japan 1967	Japan 1967		
Japan 1969	Japan 1969		
Japan 1972	Japan 1972		
Japan 1976	Japan 1976		
Japan 1979	Japan 1979		
Japan 1980	Japan 1980		

Choice Set Size	Manifestos Project	Chapel Hill Expert Survey	Party System Polarization Index
Japan 1983	Japan 1983		
Japan 1986	Japan 1986		
Japan 1990	Japan 1990		
Japan 1993	Japan 1993		
Latvia 1998	Latvia 1998		
Latvia 2002	Latvia 2002	Latvia 2002	
Luxembourg 1951	Luxembourg 1951		
Luxembourg 1954	Luxembourg 1954		
Luxembourg 1959	Luxembourg 1959		
Luxembourg 1964	Luxembourg 1964		
Luxembourg 1968	Luxembourg 1968		
Luxembourg 1974	Luxembourg 1974		
Luxembourg 1979	Luxembourg 1979		
Luxembourg 1984	Luxembourg 1984		
Luxembourg 1989	Luxembourg 1989		
Luxembourg 1994	Luxembourg 1994		
Macedonia 2002	Macedonia 2002		
Macedonia 2006	Macedonia 2006		
Macedonia 2008	Macedonia 2008		
Macedonia 2011	Macedonia 2011		
Macedonia 2014	Macedonia 2014		
New Zealand 1946	New Zealand 1946		
New Zealand 1949	New Zealand 1949		
New Zealand 1951	New Zealand 1951		
New Zealand 1954	New Zealand 1954		
New Zealand 1957	New Zealand 1957		
New Zealand 1960	New Zealand 1960		
New Zealand 1963	New Zealand 1963		
New Zealand 1966	New Zealand 1966		
New Zealand 1969	New Zealand 1969		
New Zealand 1972	New Zealand 1972		
New Zealand 1975	New Zealand 1975		
New Zealand 1978	New Zealand 1978		
New Zealand 1981	New Zealand 1981		
New Zealand 1984	New Zealand 1984		
New Zealand 1987	New Zealand 1987		
New Zealand 1990	New Zealand 1990		
New Zealand 1993	New Zealand 1993		
Poland 1991	Poland 1991		
Poland 1997	Poland 1997		Poland 1997
Poland 2001	Poland 2001	Poland 2001	Poland 2001

Choice Set Size	Manifestos Project	Chapel Hill Expert Survey	Party System Polarization Index
Poland 2005	Poland 2005	Poland 2005	Poland 2005
Poland 2007	Poland 2007	Poland 2007	Poland 2007
Poland 2011	Poland 2011	Poland 2011	Poland 2011
Romania 1990	Romania 1990		
Romania 1992	Romania 1992		
Romania 1996	Romania 1996		Romania 1996
Romania 2000	Romania 2000	Romania 2000	
Slovakia 1998	Slovakia 1998		
Slovakia 2002	Slovakia 2002	Slovakia 2002	
Slovakia 2006	Slovakia 2006	Slovakia 2006	
Slovakia 2010	Slovakia 2010	Slovakia 2010	Slovakia 2010
Slovakia 2012	Slovakia 2012	Slovakia 2012	
Slovakia 2016		Slovakia 2016	Slovakia 2016
South Africa 1994	South Africa 1994		
South Africa 1999	South Africa 1999		
South Africa 2004	South Africa 2004		
South Africa 2009	South Africa 2009		South Africa 2009
South Africa 2014	South Africa 2014		South Africa 2014
Spain 2000	Spain 2000	Spain 2000	Spain 2000
Spain 2004	Spain 2004	Spain 2004	Spain 2004
Spain 2008	Spain 2008	Spain 2008	Spain 2008
Spain 2011	Spain 2011	Spain 2011	
Spain 2015	Spain 2015	Spain 2015	
Spain 2016		Spain 2016	
Sweden 2002	Sweden 2002	Sweden 2002	Sweden 2002
Sweden 2010	Sweden 2010	Sweden 2010	
Sweden 2014		Sweden 2014	Sweden 2014
Switzerland 1999	Switzerland 1999		Switzerland 1999
Switzerland 2003	Switzerland 2003		Switzerland 2003
Switzerland 2007	Switzerland 2007		Switzerland 2007
Switzerland 2011	Switzerland 2011		Switzerland 2011
Switzerland 2015			
Turkey 1983	Turkey 1983		
Turkey 1987	Turkey 1987		
Turkey 1991	Turkey 1991		
Turkey 1995	Turkey 1995		
Turkey 1999	Turkey 1999		
Turkey 2002	Turkey 2002		
Turkey 2007	Turkey 2007		
Turkey 2011	Turkey 2011		Turkey 2011
Turkey 2015 (June)	Turkey 2015 (June)		

Choice Set Size	Manifestos Project	Chapel Hill Expert Survey	Party System Polarization Index
Turkey 2015 (November)	Turkey 2015 (November)		
United Kingdom 1945	United Kingdom 1945		
United Kingdom 1950	United Kingdom 1950		
United Kingdom 1951	United Kingdom 1951		
United Kingdom 1955	United Kingdom 1955		
United Kingdom 1959	United Kingdom 1959		
United Kingdom 1964	United Kingdom 1964		
United Kingdom 1966	United Kingdom 1966		
United Kingdom 1970	United Kingdom 1970		
United Kingdom 1974 (February)	United Kingdom 1974 (February)		
United Kingdom 1974 (October)	United Kingdom 1974 (October)		
United Kingdom 1979	United Kingdom 1979		
United Kingdom 1983	United Kingdom 1983		
United Kingdom 1987	United Kingdom 1987		
United Kingdom 1992	United Kingdom 1992		
United Kingdom 1997	United Kingdom 1997	United Kingdom 1997	United Kingdom 1997
United Kingdom 2001	United Kingdom 2001	United Kingdom 2001	
United Kingdom 2005	United Kingdom 2005	United Kingdom 2005	United Kingdom 2005
United Kingdom 2010	United Kingdom 2010	United Kingdom 2010	
United Kingdom 2015	United Kingdom 2015	United Kingdom 2015	United Kingdom 2015

Online appendix B: Robustness checks

This appendix examines the robustness of the results presented in the main part of the article. It tests whether the results hold even when alternative specifications of *democratic development* and *ethnic fractionalization* are used. In addition to the variable *e_democ* from the V-Dem data (Coppedge *et al.*, 2018) measuring the democratic development, this appendix uses also *e_fh_ipolity2* from the same dataset. In addition to the measure of ethnic fractionalization by Alesina et al. (2003), the tables below examine the effect of the measure developed by Fearon (2003).

The main conclusion of the research presented in the main part is that increasing choice set size (i.e. the number of options provided to voters on the ballot) increases the difference between the real resulting fragmentation of a party system compared to its expected value for the given set of electoral rules. The tables below confirm that the results presented in the main part of the article are robust also to the alternative operationalization of the potential confounders.

In order to simplify the comparison of the tables below, they follow the same structure even though some of the variables do not enter the statistical models in every table.

Table B.1. Results of robustness check

	Dependent variable: $\lvert d_{s_1} \rvert$				
	(B1)	(B2)	(B3)	(B4)	(B5)
Manifesto Project					
Chapel Hill Expert Survey					
Party System Polarization Index					
Weighted average number of options (ln)	0.037***	0.034**	0.031**	0.034**	0.030**
	(0.012)	(0.013)	(0.014)	(0.013)	(0.014)
Average district magnitude		-0.0002	-0.0003*	-0.0002	-0.0004
		(0.0002)	(0.0002)	(0.0002)	(0.0002)
Democratic development		0.002	0.004		
(Variable *e_democ* from V-Dem data)		(0.008)	(0.008)		
Democratic development				0.0004	0.002
(Variable *e_fh_ipolity2* from V-Dem data)				(0.010)	(0.011)
Length of democratic tradition		-0.0002	-0.0003	-0.0002	-0.0003
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
GDP per capita		-0.00000	-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.042		0.042	
As measured by Alesina et al. (2003)		(0.067)		(0.067)	
Ethnic fractionalization			0.092		0.091
As measured by Fearon (2003)			(0.090)		(0.090)
Constant	0.012	0.021	0.004	0.038	0.019
	(0.028)	(0.081)	(0.086)	(0.096)	(0.102)
Observations	165	165	165	165	165
R^2	0.110	0.159	0.184	0.158	0.182
Adjusted R^2	0.105	0.127	0.153	0.126	0.151

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.2. Results of robustness check

	Dependent variable: $\lvert d_{N_s} \rvert$				
	(B6)	(B7)	(B8)	(B9)	(B10)
Manifesto Project					
Chapel Hill Expert Survey					
Party System Polarization Index					
Weighted average number of options (ln)	0.048***	0.045***	0.040***	0.045***	0.041***
	(0.012)	(0.014)	(0.013)	(0.014)	(0.013)
Average district magnitude		-0.0002	-0.0003**	-0.0001	-0.0003*
		(0.0002)	(0.0001)	(0.0002)	(0.0002)
Democratic development		-0.005	-0.003		
(Variable *e_democ* from V-Dem data)		(0.007)	(0.007)		
Democratic development				-0.006	-0.004
(Variable *e_fh_ipolity2* from V-Dem data)				(0.009)	(0.009)
Length of democratic tradition		-0.00002	-0.0002	-0.00002	-0.0002
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
GDP per capita		-0.00000	-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.063		0.063	
As measured by Alesina et al. (2003)		(0.078)		(0.078)	
Ethnic fractionalization			0.127		0.127
As measured by Fearon (2003)			(0.094)		(0.094)
Constant	-0.007	0.045	0.023	0.052	0.027
	(0.028)	(0.070)	(0.070)	(0.080)	(0.082)
Observations	165	165	165	165	165
R^2	0.186	0.235	0.279	0.235	0.279
Adjusted R^2	0.181	0.206	0.252	0.206	0.251

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.3. Results of robustness check

	Dependent variable: $\lvert d_{s_1} \rvert$				
	(B11)	(B12)	(B13)	(B14)	(B15)
Manifesto Project	-0.0001	0.0004	0.0004	0.0003	0.0003
	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0005)
Chapel Hill Expert Survey					
Party System Polarization Index					
Weighted average number of options (ln)	0.043***	0.033**	0.028	0.032*	0.027
	(0.015)	(0.016)	(0.017)	(0.017)	(0.018)
Average district magnitude		-0.0003	-0.0004	-0.0003	-0.0004
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
Democratic development		0.005	0.006		
(Variable *e_democ* from V-Dem data)		(0.009)	(0.009)		
Democratic development				0.003	0.005
(Variable *e_fh_ipolity2* from V-Dem data)				(0.011)	(0.012)
Length of democratic tradition		-0.0003	-0.0004	-0.0003	-0.0004
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
GDP per capita		-0.00000	-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.048		0.047	
As measured by Alesina et al. (2003)		(0.068)		(0.069)	
Ethnic fractionalization			0.100		0.099
As measured by Fearon (2003)			(0.093)		(0.094)
Constant	0.007	-0.009	-0.020	0.007	-0.006
	(0.032)	(0.087)	(0.090)	(0.101)	(0.106)
Observations	155	155	155	155	155
R^2	0.122	0.167	0.194	0.165	0.192
Adjusted R^2	0.111	0.128	0.156	0.126	0.153

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.4. Results of robustness check

	Dependent variable: $\lvert d_{N_s} \rvert$				
	(B16)	(B17)	(B18)	(B19)	(B20)
Manifesto Project	-0.0001	0.0003	0.0003	0.0003	0.0003
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Chapel Hill Expert Survey					
Party System Polarization Index					
Weighted average number of options (ln)	0.051***	0.042**	0.035**	0.042**	0.035**
	(0.016)	(0.017)	(0.017)	(0.017)	(0.017)
Average district magnitude		-0.0002	-0.0004*	-0.0002	-0.0004*
		(0.0002)	(0.0002)	(0.0002)	(0.0002)
Democratic development		-0.001	0.0002		
(Variable *e_democ* from V-Dem data)		(0.007)	(0.007)		
Democratic development				-0.002	0.0001
(Variable *e_fh_ipolity2* from V-Dem data)				(0.008)	(0.009)
Length of democratic tradition		-0.0001	-0.0003	-0.0001	-0.0003
		(0.0004)	(0.0004)	(0.0004)	(0.0004)
GDP per capita		-0.00000	-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.069		0.068	
As measured by Alesina et al. (2003)		(0.081)		(0.081)	
Ethnic fractionalization			0.136		0.136
As measured by Fearon (2003)			(0.099)		(0.099)
Constant	-0.010	0.016	0.002	0.019	0.002
	(0.030)	(0.077)	(0.076)	(0.083)	(0.085)
Observations	155	155	155	155	155
R^2	0.180	0.230	0.278	0.230	0.278
Adjusted R^2	0.169	0.193	0.243	0.193	0.243

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.5. Results of robustness check

	Dependent variable: $\lvert d_{s_1} \rvert$				
	(B21)	(B22)	(B23)	(B24)	(B25)
Manifesto Project					
Chapel Hill Expert Survey	-0.005	-0.009	-0.007	-0.009	-0.008
	(0.010)	(0.011)	(0.011)	(0.010)	(0.009)
Party System Polarization Index					
Weighted average number of options (ln)	0.025***	0.027***	0.026***	0.030***	0.030***
	(0.009)	(0.010)	(0.010)	(0.008)	(0.009)
Average district magnitude		0.0003**	0.0003***	0.0001	0.0002
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Democratic development		-0.001	0.001		
(Variable *e_democ* from V-Dem data)		(0.022)	(0.023)		
Democratic development				0.048	0.048
(Variable *e_fh_ipolity2* from V-Dem data)				(0.042)	(0.042)
Length of democratic tradition		0.0001	0.0002	0.0002	0.0002
		(0.0002)	(0.0002)	(0.0003)	(0.0002)
GDP per capita		-0.00000	-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		-0.043		-0.031	
As measured by Alesina et al. (2003)		(0.076)		(0.084)	
Ethnic fractionalization			-0.021		-0.015
As measured by Fearon (2003)			(0.063)		(0.060)
Constant	0.062	0.090	0.059	-0.362	-0.381
	(0.068)	(0.237)	(0.253)	(0.417)	(0.412)
Observations	52	52	52	52	52
R^2	0.120	0.160	0.157	0.193	0.191
Adjusted R^2	0.084	0.026	0.023	0.065	0.063

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.6. Results of robustness check

	Dependent variable: $\lvert d_{N_s} \rvert$				
	(B26)	(B27)	(B28)	(B29)	(B30)
Manifesto Project					
Chapel Hill Expert Survey	-0.008	-0.005	-0.006	-0.009	-0.010
	(0.008)	(0.007)	(0.007)	(0.007)	(0.006)
Party System Polarization Index					
Weighted average number of options (ln)	0.026***	0.031***	0.032***	0.033***	0.033***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)
Average district magnitude		-0.0001	-0.0001	-0.0001	-0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)
Democratic development		0.028	0.028		
(Variable *e_democ* from V-Dem data)		(0.023)	(0.024)		
Democratic development				0.073**	0.072**
(Variable *e_fh_ipolity2* from V-Dem data)				(0.031)	(0.031)
Length of democratic tradition		0.00002	-0.00003	0.0001	0.0001
		(0.0003)	(0.0002)	(0.0003)	(0.0003)
GDP per capita		0.00000	0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.045		0.028	
As measured by Alesina et al. (2003)		(0.073)		(0.073)	
Ethnic fractionalization			0.032		0.018
As measured by Fearon (2003)			(0.056)		(0.053)
Constant	0.078	-0.240	-0.224	-0.628**	-0.614**
	(0.053)	(0.228)	(0.236)	(0.306)	(0.290)
Observations	52	52	52	52	52
R^2	0.137	0.192	0.192	0.236	0.236
Adjusted R^2	0.101	0.064	0.063	0.115	0.114

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.7. Results of robustness check

	Dependent variable: $\lvert d_{s_1} \rvert$				
	(B31)	(B32)	(B33)	(B34)	(B35)
Manifesto Project					
Chapel Hill Expert Survey					
Party System Polarization Index	-0.007	-0.006	-0.005	-0.006	-0.006
	(0.014)	(0.015)	(0.014)	(0.016)	(0.015)
Weighted average number of options (ln)	0.041***	0.051***	0.050***	0.051***	0.050***
	(0.015)	(0.013)	(0.011)	(0.013)	(0.011)
Average district magnitude		0.00000	-0.0001	-0.0002	-0.0003
		(0.0002)	(0.0002)	(0.0003)	(0.0003)
Democratic development		0.026*	0.030**		
(Variable *e_democ* from V-Dem data)		(0.014)	(0.015)		
Democratic development				0.026	0.033
(Variable *e_fh_ipolity2* from V-Dem data)				(0.031)	(0.034)
Length of democratic tradition		0.0004	0.0003	0.0004	0.0003
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
GDP per capita		-0.00000*	-0.00000*	-0.00000*	-0.00000*
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.067		0.068	
As measured by Alesina et al. (2003)		(0.083)		(0.087)	
Ethnic fractionalization			0.113		0.111
As measured by Fearon (2003)			(0.089)		(0.094)
Constant	0.013	-0.238	-0.288*	-0.234	-0.310
	(0.047)	(0.153)	(0.162)	(0.307)	(0.329)
Observations	55	55	55	55	55
R^2	0.158	0.296	0.338	0.266	0.304
Adjusted R^2	0.126	0.191	0.239	0.157	0.200

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

Table B.8. Results of robustness check

	Dependent variable: $\lvert d_{N_s} \rvert$				
	(B36)	(B37)	(B38)	(B39)	(B40)
Manifesto Project					
Chapel Hill Expert Survey					
Party System Polarization Index	-0.015	-0.013	-0.012	-0.013	-0.012
	(0.014)	(0.015)	(0.013)	(0.015)	(0.014)
Weighted average number of options (ln)	0.051***	0.054***	0.053***	0.053***	0.052***
	(0.017)	(0.018)	(0.013)	(0.017)	(0.013)
Average district magnitude		-0.0001	-0.0003	-0.0002	-0.0004
		(0.0003)	(0.0003)	(0.0002)	(0.0002)
Democratic development		0.006	0.012		
(Variable *e_democ* from V-Dem data)		(0.014)	(0.014)		
Democratic development				-0.003	0.006
(Variable *e_fh_ipolity2* from V-Dem data)				(0.026)	(0.028)
Length of democratic tradition		0.0002	0.0001	0.0002	0.0001
		(0.0003)	(0.0003)	(0.0003)	(0.0003)
GDP per capita		-0.00000	-0.00000	-0.00000	-0.00000
		(0.00000)	(0.00000)	(0.00000)	(0.00000)
Ethnic fractionalization		0.118		0.116	
As measured by Alesina et al. (2003)		(0.083)		(0.084)	
Ethnic fractionalization			0.166**		0.162**
As measured by Fearon (2003)			(0.079)		(0.082)
Constant	0.028	-0.049	-0.114	0.038	-0.057
	(0.049)	(0.162)	(0.165)	(0.268)	(0.280)
Observations	55	55	55	55	55
R^2	0.237	0.367	0.423	0.365	0.415
Adjusted R^2	0.208	0.272	0.337	0.270	0.328

Note: *p<0.1; **p<0.05; ***p<0.01; Regression with clustered robust standard errors in parentheses

References

Alesina, A. *et al.* (2003) 'Fractionalization', *Journal of Economic Growth*, 8(2), pp. 155–194. doi: 10.1023/A:1024471506938.

Coppedge, M. *et al.* (2018) 'V-Dem [Country-Year/Country-Date] Dataset v8'. Varieties of Democracy (V-Dem) Project. doi: 10.23696/vdemcy18.

Fearon, J. D. (2003) 'Ethnic and Cultural Diversity by Country', *Journal of Economic Growth*, 8(2), pp. 195–222. doi: 10.1023/A:1024419522867.